SBC3 CAN
User Manual

Version 2.4

SBC3 CAN

SBC3 CAN

(External Antennas)

Table of Contents

1 Introduction 5

2 Delivery content 6

3 Technical Data 7

4 Operation set-up 8

4.1 Open the Device 8

4.2 Inserting the SIM Card 8

4.2.1 Description of Wires and Connectors 10

4.2.1.1 Wiring description of the inputs 10

4.2.2 Antennas 11

4.2.3 Switching the device on and off 11

4.2.4 Status Indicators 12

5 Troubleshooting Hints 14

5.1 The device doesn't show any sign of life 14

5.2 The device doesn't log into the GSM network 14

5.3 The device doesn't log into the GPRS network 15

5.4 The device doesn't send messages 15

5.5 The device doesn't receive GPS data 15

5.5.1 Close the Cover 15

6 Basic features 17

6.1 Event Types 17

6.2 Connection Establishment Procedure 17

6.3 Event Message Structure 17

7 ADVANCED FEATURES 19

7.1 Geofencing 19

7.2 Roaming alternative configuration 19

7.3 Input alternative configuration 19

7.4 Device Watchdogs 19

7.5 1-Wire 19

7.6 CAN bus 20

7.7 RS232 20

8 Connect to the Vehicle 21

8.1.1 Placing the device into the vehicle 21

8.1.2 Wiring connection 21

9 Safety 22

9.1 General Battery handling 22

9.2 Battery storage 22

9.3 Battery disposal 22

10 General Terms and Conditions _____ *23*

11 Compliance Statements _____ *24*

11.1 CE Declaration of Conformity _____ **24**

11.2 FCC Verification _____ **25**

12 Document history _____ *26*

Table Overview

Table 1: The 3 different versions of the SBC3 CAN 5
Table 2: Accessories List 6
Table 3: Technical Data 7
Table 4: Left-side 6 pin Connector 11
Table 5: 6 pin Connector in the middle 11
Table 6: Right-side 3 pin Connector 11
Table 7: Meaning of the assigned Indicator 13
Table 8: Troubleshooting: Device doesn't show any sign of life 14
Table 9: Troubleshooting: Device doesn't log into the GSM network 14
Table 10: Troubleshooting: Device doesn't log into the GPRS network 15
Table 11: Troubleshooting: Device doesn't send messages 15
Table 12: Troubleshooting: Device doesn't receive GPS data 15
Table 13: Content Description 18
Table 14: Document history 26

Figure Overview

Figure 3: How to open the device 8
Figure 4: How to flip the card reader up 9
Figure 5: How to insert the SIM Card 9
Figure 6: Connectors available in the SBC3 CAN 10
Figure 7: Switching the device on and off 12
Figure 8: Description of the LED's 12
Figure 9: How to close the device 16
Figure 10: Geofencing 19

1 Introduction

The SBC3 CAN is a highly reliable telematics unit which combines robustness with a wide range of interfaces for external peripheral devices. This makes the SBC3 CAN the perfect instrument for high value fleet management applications. Actually, this device can interface with any kind of vehicles, i.e. it can also be used for non-automotive projects.

Typical use cases include:

Automated Vehicle Location – AVL

- Fleet Management
- Leasing
- Taxi / public transport

Security tracking of…

- Vehicles
- Construction machines

In order to provide the necessary flexibility to cover any possible application scenarios, the SBC3 CAN is available in 3 different versions which are summarized in Table 1.

SBC3 CAN	SBC3 CAN (External Antennas)	SBC3 CAN Power
This unit includes GSM and GPS antennas already inside the box. Main benefits: – Very high IP protection – Strongly reduced on vehicle installation time – Extremily easy to be hidden – Maximum protection against sabotage attempt	The device is available for specific use cases also with external GPS and GSM antennas. Those antennas can be purchased as accessory by Telic GmbH or bought on the market.	This unit features a larger 4 Ah internal battery and enables longer duration tracking or tracking vehicles and other assets at a higher transmission frequency.

Table 1: The 3 different versions of the SBC3 CAN

2 Delivery content

In addition to the SBC3 CAN, the following accessories can be part of the shipment, if previously ordered.

Accessory Name	Order code	Functionality	Picture
Connection cable for SBC3	16300	This is the standard cable provided for automotive application.	
Cable for Config-Tool SBC3 CAN	16214	Use this cable to configure the unit via serial interface	
GSM/GPS Antenna for SBC3 CAN (External Antennas)	16004	Combo GPS/GSM antennas.	

Table 2: Accessories List

3 Technical Data

Features	SBC3 CAN	SBC3 CAN EXT	SBC3 CAN Power
Type Approvals	CE, FCC, E1	CE, E1	CE, E1
GSM Module	Telit GE865		
GNSS Module	Telit JN3		
Housing	robust & water protected		
Antenna Connector	N/A	GSM: FME Male GPS: SMA Female	N/A
Interface Connector	2x 6-pin connector 1x 3-pin connector		
External voltage range	7V - 32V		
Battery Capacity	660 mAh (LiPo)	660 mAh (LiPo)	4000 mAh (LiPo)
Typical consumption in sleep Mode (@12V) - external source	~ 1 mA		
Typical consumption in sleep Mode - internal battery	0,14 mA		
Dimensions	150x65x45 mm		
Operating temperature	-30°C to +75°C		
Recharging temperature	0°C to +45°C		

Table 3: Technical Data

4 Operation set-up

The operation set-up of the tracking and tracing module can be realized in few quick steps.

	Please take proper ESD protection measures (e.g. electrical connection of the body to ground) to make sure you don't destroy internal electronics! Repair of ESD damages caused by user's negligence will not be covered by Telic's warranty. Electrostatic discharge (ESD) is the sudden and momentary electric current that flows between two objects at different electrical potentials normally caused by static electricity.

4.1 Open the Device

Open the SBC3 housing by unscrewing the 4 Phillips housing screws. The SIM card holder can be found under the top cover.

Figure 1: How to open the device

4.2 Inserting the SIM Card

A working SIM card from a suitable network provider must be properly inserted in order for the device to operate correctly.

The insertion of the SIM card into the SBC3 is easy:

- Place the device in front of you on the desk such that the external connectors are facing away from you.
- Slide the SIM card cover carefully away from yourself towards the direction of the arrow between the two words "OPEN"

	If the SIM card is not PIN free, it has to be ensured that the PIN is set to "0000". To speed up the log-in process into the GSM network, the SIM card should contain no or only a few phone book entries.

	The messages of the SBC3 CAN are transmitted via the mobile GSM network. Therefore you need a standard 3 Volts or 1.8 Volts SIM card. Please give preference to post-paid SIM cards!

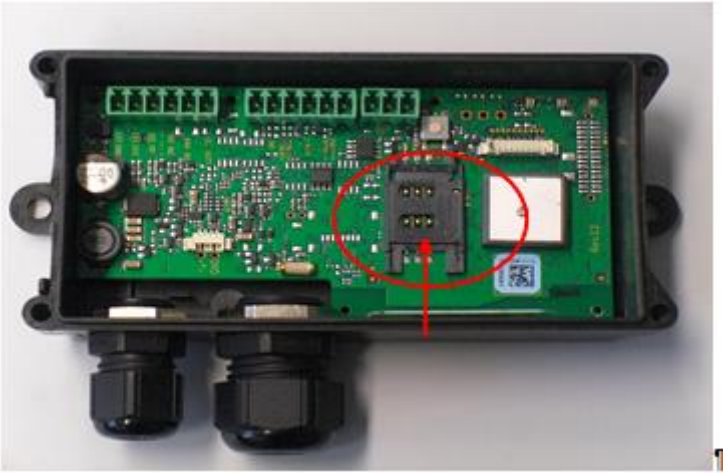


Figure 2: How to flip the card reader up

- carefully flip the card reader sideways then up (see picture)

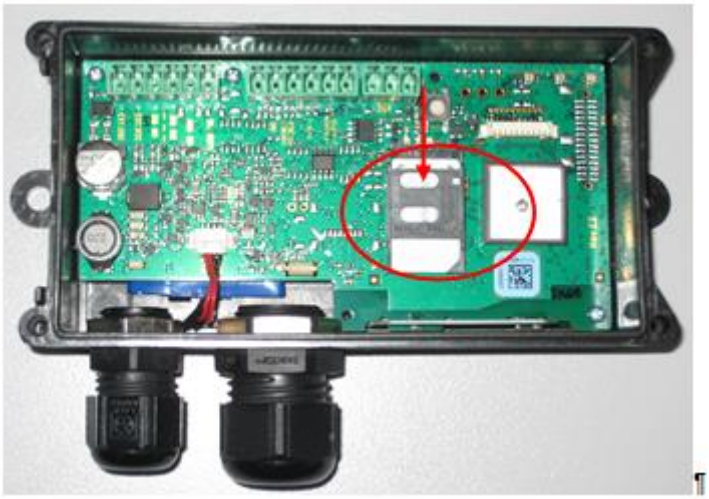


Figure 3: How to insert the SIM Card

- Now insert the SIM card into the SIM card holder so that the cut corner matches with the corresponding marking on the SIM card holder. Do not touch the contacts of the SIM card. If necessary clean the contacts with a soft cloth.
- When inserted correctly the gold contacts of the SIM card should be facing down.
- Flip the SIM card holder back into its original position and slide the lock back towards your body
- If you cannot close the SIM card holder, you may have inserted the SIM card in the wrong direction

With this step you have finished the SIM card installation

4.2.1 Description of Wires and Connectors

The wires connection on the unit side has to be performed before to reclose the lid, while the device is still switched off. The bundling cables must pass through the PG holes and then each single wire has to be screwed inside the desired pins.

	All the unused wires have to be isolated in order to avoid dangerous contacts with metallic/electronic parts once the unit is installed into the vehicle.

	Please note that while in the SBC3 CAN, the wire connectors can be clicked onto the board, the wire connectors on the SBC3 CAN with external antennas and SBC3 CAN Power are soldered directly onto the board.

4.2.1.1 Wiring description of the inputs

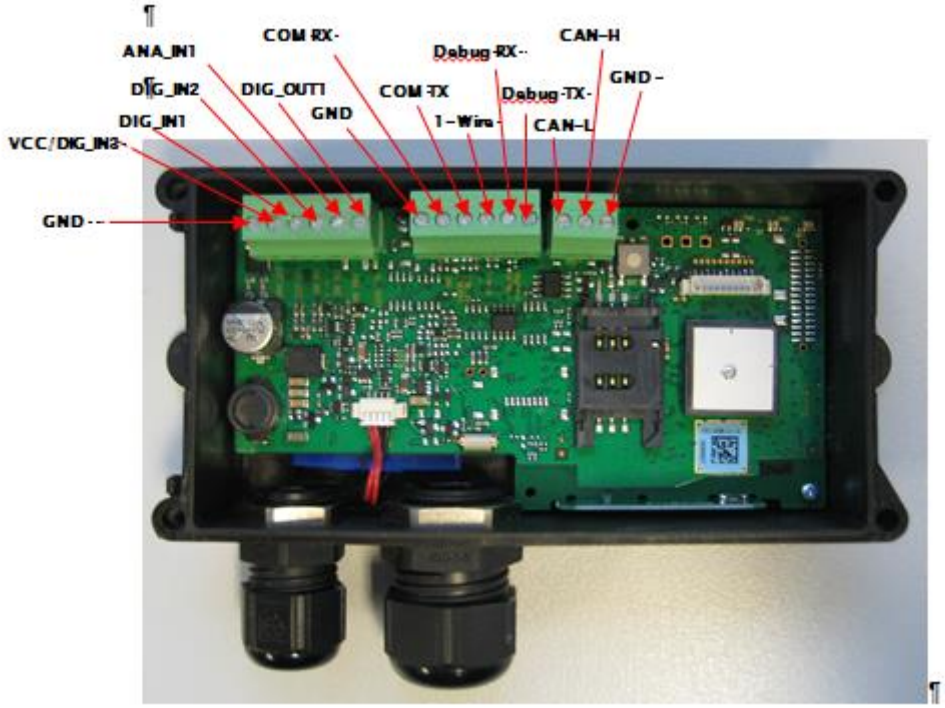


Figure 4: Connectors available in the SBC3 CAN

Signal	Description
GND	Ground
VCC / DIG_IN3	External power supply 0 – 32V DC (optional digital input)
DIG_IN1	digital input 0 – 32V / DC
DIG_IN2	digital input 0 – 32V / DC
DIG_IN4 / ANA_IN1	analog input 0 – 30V / DC
DIG_Out1	Low side switch, max. 1A

Table 4: Left-side 6 pin Connector

Signal	Description
GND	serial ground
COM RX	interface for external serial device V24 level -12V … +12V
COM TX	interface for external serial device V24 level -12V … +12V
1-wire	interface for external 1-wire devices 3,3V / DC
Debug RX	serial interface for Telic-Traces V24 level -12V … +12V
Debug TX	serial interface for Telic-Traces V24 level -12V … +12V

Table 5: 6 pin Connector in the middle

Signal	Description
CAN_L	bus signal CAN low
CAN_H	bus signal CAN high
GND	CAN ground

Table 6: Right-side 3 pin Connector

4.2.2 Antennas

The SBC3 CAN devices have both GPS and GSM antennas integrated, therefore, no external antennas are required. For SBC3 CAN with external antennas remember to connect them, otherwise the unit will not be able to get a GPS fix and transmit via GSM.

4.2.3 Switching the device on and off

Normally the device is delivered by Telic switched off.

If the Telic SBC3 CAN unit is switched off, you can switch it on by a single short press of the white button (see Figure 5)

If you want to switch the device off, then double press shortly the white button. It is possible to reset the device (complete power off of the controller) with a single long press of at least 5 seconds.

Figure 5: Switching the device on and off

4.2.4 Status Indicators

Figure 6: Description of the LED's

The device has three LEDs. The blinking patterns of these LEDs can give you valuable information about the proper function of the device:

Assigned indicator	Meaning
POWER	The left indicator consists of 2 LEDs, one green and one red. The green LED will be permanently on, when the Telic SBC3 has external power supply and the battery is full charged. While charging the battery, the indicator is red. Please note: If the LED is off, this does not mean, that the Telic SBC3 remote control unit has been switched off. Instead, if this LED is off, this means, that the device currently does not receive any power from an external power source.

Assigned indicator	Meaning
COM	The yellow LED reflects the GSM status. ▪ Off: The GSM module is not switched on ▪ Permanently on: GSM is switched on, but no GSM networks available: ▪ Blinking once: device is logged into the GSM network, no connection to server ▪ Blinking twice: device is logged into GSM network, GPRS is attached, established TCP/IP connection to server ▪ Blinking 3 times: there is no SIM CARD either wrong PIN ▪ Blinking quickly 5 times: a configuration SMS is detected Consider that the LED will flash every 10 seconds for a period of 3 seconds if the device is configured to transmit AED-data but there are no connected peripherals (AED-error condition).
GPS	This LED blinks green and indicates the status of the GPS-receiver. ▪ Off: GPS is not switched on ▪ Blinking once: position acquisition not possible ▪ Blinking twice: 2D-Fix (no valid height) ▪ Blinking 3 times: 3D-Fix (GPS data is complete) The red LED lights up when the on/off white button is pressed. After start-up as well as after a phase without GPS reception the device only accepts 3D GPS positions. This ensures, that 2D position reports with serious deviations from the real position are not reported to the control centre. After a while, 2D position reports are accepted because the GPS receiver then had enough time to evaluate the signal quality of all available GPS satellites.

Table 7: Meaning of the assigned Indicator

5 Troubleshooting Hints

5.1 The device doesn't show any sign of life

Possible issue source	Trouble shooting
The device is not connected correctly	Please connect the device to the vehicle/power source following instructions in the user manual.

Table 8: Troubleshooting: Device doesn't show any sign of life

5.2 The device doesn't log into the GSM network

Possible issue source	Trouble shooting
The device isn't in a GSM covered area	Please check whether there is GSM reception in this area (e.g. using a cell phone) and move eventually to another area.
The position of the device is not favourable.	Choose another place in the vehicle which might be less shielded.
The SIM card in the devices new and has not yet been activated	Please check, whether the SIM card is already activated. This can be done e.g., by putting the SIM card into your cell phone and checking, whether your cell phone is able to log into a GSM network.
The SIM card has been locked by the provider	Please check whether the SIM card is locked. This can be done e.g. by putting the SIM card into your cell phone and checking, whether your cell phone is able to log into a GSM network. If this not the case, then please try to make a phone call. If you are successful, the SIM card is definitely not locked.
The prepaid bonus is exhausted	Please recharge the SIM card in the Picotrack device.
The prepaid SIM card is no longer valid	If they aren't recharged on a regular basis (often after 12 or 24 months). In this case usually you have to buy a new SIM card.
The PIN code of the card has not been deactivated or is not set to "0000"	Please remove the SIM card from the device and check the PIN code. The Pin code has to be deactivated or set to "0000" After a triple wrong entry of the PIN, unblocking the SIM card requires the PUK.
The SIM card hasn't been inserted into the SIM card holder in the correct way	Please check the correct position of the SIM card in the card holder.

Table 9: Troubleshooting: Device doesn't log into the GSM network

5.3 The device doesn't log into the GPRS network

Possible issue source	Trouble shooting
The GPRS service is not yet activated	Please ask your provider, whether the GPRS function is already activated for the SIM card in use.

Table 10: Troubleshooting: Device doesn't log into the GPRS network

5.4 The device doesn't send messages

Possible issue source	Trouble shooting
Wrong GPRS settings	Please check that APN and IP address/port are properly configured

Table 11: Troubleshooting: Device doesn't send messages

5.5 The device doesn't receive GPS data

Possible issue source	Trouble shooting
The position of the device is not favourable for the GPS reception	Please check, whether the device has the indicators facing up and a clear view of the sky.
The GPS receiver has no free sight to the sky	Please be aware, that a GPS receiver needs always a clear view of the sky. Please ensure that the device side with the LEDs has free view to the sky.

Table 12: Troubleshooting: Device doesn't receive GPS data

Further hints regarding sources of error are indicated through the LEDs of the 3 indicators, which are easily visible from outside.

5.5.1 Close the Cover

Please close the SBC3 housing by screwing the 4 Phillips screws down back into its original position. The clear plastic light guides must be located above the LEDs. Please ensure that the cover locks properly into position.

Min torque M = 1,2 Nm max. Torque M = 1,5 Nm

Figure 7: How to close the device

6 Basic features

The device can be configured via serial cable by using the Telic Configuration tool otherwise remotely via SMS and GPRS. Please contact Telic GmbH to have more details about the configuration procedure.

6.1 Event Types

The SBC3 CAN's primary task is to transmit GPS position data, including additional vehicle status information via a TCP/IP connection to the tracking server. If a message can't be transmitted, it will be stored in the device to be transmitted at a later point in time. There is a storage capacity of a minimum 20000 position messages. The following events will generate a position message which always contains the GPS position:

- **Time Event:** The end of a time period of x seconds (x being configurable).
- **Distance Event:** After a distance of x meters (straight line distance to the previous event) in any direction (x being configurable) has been travelled.
- **Angular Change Event:** A direction change of a configurable minimum angle in x degrees (x being configured) at a configurable minimum speed of y km/h (y being configurable).
- Changes of the status of the digital inputs
- Cut off and re-connect to the main power supply

6.2 Connection Establishment Procedure

The GSM module as well as the GPS module will be internally powered up after switching on the Telic SBC3 CAN unit. As soon as the GSM module has successfully logged into the GSM network all currently available GSM networks are recorded which allow the use of GPRS with the SIM card inserted into the device.

Finally a TCP/IP connection to the tracking server will be established.

The selection of the GPRS provider takes approx. 1minute as well as the log-in process into the control centre software. This means, that it will take approximately 2-3 minutes after switching the device on until the first status report can be sent to the control centre.

Independent of this delay the first GPS positions will be recorded and will be stored as status reports inside the device until they can be sent to the control centre.

6.3 Event Message Structure

The first identified and valid GPS position will be taken as the reference position for the distance interval calculations. The next distance interval event will be generated if the configured distance has been reached.

In the case of a direction change being greater than the configured angle while travelling at the configured minimum speed a position message will also be generated.

Changes of a digital input cause the transmission of a status report. If no actual GPS position is available the last known GPS position will be transmitted.

Each new status report sets a new reference point for distance calculations. The event message includes the following information

Content	Description
Event/Log – Code	Reason for the status message
Event/Log Timestamp	Time when the event was triggered
Event info	Related to Geofencing area
GPS Timestamp	GPS timestamp at the moment of fetching longitude and latitude
Longitude	Degree of longitude in 100µ degrees
Latitude	Degree of latitude in 100µ degrees
Fix Type	1,2 or 3, depending on the availability of satellites in view having a sufficient signal strength: ▪ 1D Fix (no valid data) ▪ 2D Fix (no height indication) ▪ 3D Fix (position message with height indication)
Speed over ground	Speed in km/h
Course over ground	Direction in degrees
Sats for calculation	Actual number of satellites which are used for calculation
HDOP	Not per default, to be configured
VDOP	Not per default, to be configured
Height	Height above sea level (in m)
Mileage	Mileage in km
MCC MNC	Not per default, to be configured
DigIns	4 digits e.g. 0010, if DigIn3 = High (Ignition on)
Output	Status of the output 0-1
Ext. Power	Supply voltage
Int. Battery	Voltage of the internal battery
Analog Input	Voltage of the analog input
Device ID	300
Motion sensor stationary time	In seconds
CSQ 1	Not per default, to be configured
CSQ 2	Not per default, to be configured
AED DATA	Not per default, to be configured Those are the information related to CANBUS, 1-wire, RS232. They are separated to the event message by a semicolon ';'

Table 13: Content Description

7 ADVANCED FEATURES

In this paragraph are described some advanced features supported by the device, which might be requirement for different use cases.

7.1 Geofencing

Geofencing (an electronic safety fence) provides the opportunity to set a geographic square around a defined location. Here you can set different scenarios like “leaving the area” or “entering the area” and transmit an event to the control centre. With the SBC3 CAN you can monitor 50 geofence areas which can also be combined to create larger areas and build up a complex protection zone. Every geofence area is given an Area ID, a centre (defined by its longitude and latitude) and a height and width (from the centre not completely across) in meters.

Figure 8: Geofencing

7.2 Roaming alternative configuration

The device is able to detect a GSM roaming status and swap automatically to an alternative setup for roaming (this alternative setup has to be previously configured). This allows optimizing the data traffic and reducing the communication costs.

7.3 Input alternative configuration

The device is autonomously able to handle an alternative setup when a specific input is triggered (this alternative setup has to be previously configured). This allows supporting features like “panic button”

7.4 Device Watchdogs

The SBC3 CAN has different integrated watchdogs. They automatically check the functions of the device and generate resets as soon as they recognise any malfunction. Malfunction could occur due to internal problems of the device, problems related to the GSM connection, problems with the GPS reception and many more. Due to this watchdog it is assured that the SBC3 CAN is able to return automatically to stable operation if necessary. Control of the watchdogs by the user is not necessary. If the watchdog has to restart the device it may happen that some of the position messages and respectively events are not logged and as a result they are not transmitted to the tracking server.

7.5 1-Wire

A 1-wire interface is available on the device, which allows connecting up to 8 temperature probes or ID-Button for driver recognition

7.6 CAN bus

Any CAN BUS hardware can be interfaced to the device in order to achieve information from the can bus line of the vehicle. Main application is related to FMS standard for trucks or ODBII for cars.

7.7 RS232

The device has an RS232 interface, therefore can be interfaced to any type of external peripherals connectable via standard RS232 serial.

	A lot of other features are available on SBC3 CAN but they are kept as “confidential”, therefore not disclosed on this document. Please contact the Telic Technical Pre-Sales support in case that your specific use case requires something which you don´t find described on this document.

8 Connect to the Vehicle

This section describes the procedure to install the device on board of your vehicle and check if the installation has been performed properly

	Please take proper ESD protection measures (e.g. electrical connection of the body to ground) to make sure you don't destroy internal electronics! Repair of ESD damages caused by user's negligence will not be covered by Telic's warranty. Electrostatic discharge (ESD) is the sudden and momentary electric current that flows between two objects at different electrical potentials normally caused by static electricity.

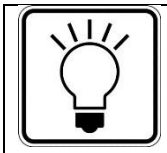
8.1.1 Placing the device into the vehicle

In order to protect your vehicle from theft and vandalism the device should be installed in a location where it and its power supply are well-hidden. Using the cable-cases, please install the device in a suitable, dry location, not in contact to radio and audio frequency interference or hot parts of the vehicle like near the engine. When installing the SBC3 CAN with internal antenna please consider that it must be installed in a place with a minimum distance of 7 cm to metallic components of the vehicle in each direction.

8.1.2 Wiring connection

Please connect the Telic SBC3 CAN to the vehicle according to the following instructions using the connection cable. Please do not connect the connector to the Telic SBC3 CAN remote control unit before all cables you intent to use are connected to the vehicle. The power supply has to be available while the ignition is off.

The GND wire (pin 1 of the 6 pin left connector) must be connected to the GROUND (pin 31 of the vehicle) and the VCC (pin 2 on pin left connector) must be connected to VCC (pin 30 of the vehicle).

	During the installation phase consider that devices with integrated antennas need to be placed in a point where GSM and GPS signal are not obstructed by the structure of the vehicle.

The advantage of constant power supply is that the device is able to connect faster to the GSM network and it can find faster a new GPS position after ignition was switched from "OFF" to "ON". This means that for example working time calculations will be more precise. With ignition off the power consumption of the Telic SBC3 CAN is low enough that it does not interfere with proper functionality of the vehicle battery.

If the Telic SBC3 CAN remote control unit is configured to use a motion dependent power mode, the device can detect and report that it is moving (e.g. if it is stolen or being transported via a second vehicle) even while ignition is off.

9 Safety

The following guidelines must be followed in order to ensure the safety of users. If these rules are ignored Telic will not assume responsibility for any damages that are incurred.

9.1 General Battery handling

Because the SBC3 CAN main power source is a battery with high energy content. They are designed to represent the highest possible degree of safety. They may, however, present a potential hazard if they are abused electrically or mechanically. This is in most circumstances associated with the generation of excessive heat. In this case the internal pressure may cause the cell case to rupture.

As a result the following general guidelines should be followed when handling the SBC3 CAN Battery:

- Do not short-circuit
- Do not over discharge
- Do not incinerate
- Do not expose to temperatures beyond the specified
- temperature range
- Do not crush or puncture
- Do not open cells, do not disassemble battery packs
- Do not expose contents to water
- Do not connect with false polarity
- Do not weld or solder to the battery's body

It is very important that only authorized official Telic replacement batteries be used in the SBC3 CAN. Also the batteries included with the devices are only tested or authorized for use in the SBC3 CAN. The batteries should never be used in any other devices unless specifically authorized by Telic, including but not limited to other Telic products or devices.

9.2 Battery storage

Batteries should be stored in rooms with generally low temperature and low humidity levels. While it is not essential that these storage areas be temperature and humidity controlled, temperatures should generally be kept below 35 °C and storage areas should be well ventilated. Storage temperatures above 75 °C should be avoided.

Your SBC3 CAN batteries should be stored in their original packaging materials or in the SBC3 CAN itself. This will eliminate unintentional shorting. Do not store batteries in conductive anti-static bags or foam unless the resistivity of the material exceeds 1 MΩ. Batteries should not be placed on or covered with metallic or otherwise conductive material.

Batteries should be stored away from any flammable material in the storage area. Fire extinguishers for metal fire (class D) are preferred. Do not attempt to extinguish fires with small amounts of water, sand, or with carbon dioxide extinguishers.

9.3 Battery disposal

The disposal or recycling of batteries is regulated by each European country. In each country, the manufacturers, importers and users are responsible for the proper disposal. The European Community (EC) has issued two directives, 91/157/EEC and 93/86/EEC. These directives are implemented by each member country of the EC independently and in a different way. In accordance with these directives, The SBC3 CAN Batteries do not contain dangerous substances. The

reaction products are inorganic and do not represent environmental risks once the decomposition process has terminated.

10 General Terms and Conditions

All information in this documentation has been carefully assembled and checked, but should not be considered as a guaranteed feature set. The copyright of the related documentation is with Telic GmbH.

The Telic Logo and the terms Telic, and Telic SBC3 CAN are brands of Telic GmbH. All further names and terms used can be brands or registered brands of their respective owners.

Telic preserves the right to change the included information without notice and doesn't take responsibility for errors in the document and/or missing information.

11 Compliance Statements

11.1 CE Declaration of Conformity

Telic
Telematik & Telemetrie

Telic GmbH
Telematik & Telemetrie
Raiffeisenallee 12b
82041 Oberhaching
Telefon 089 / 450292-0
Telefax 089 / 450292-

CE Konformitätserklärung
CE Declaration of Conformity

Hiermit erklären wir, dass die folgenden Produkte
Hereby we declare that the following products

SBC3 CAN (Product ID: 0346)
SBC3 CAN Power (Product ID: 0345)
SBC3 CAN EXT (Product ID: 0344)

den folgenden Normen und Richtlinien entsprechen:
comply with the following European standards and regulations:

Nummer / Kurztitel *Number / Title*	Eingehaltene Vorschriften *Observed regulations*	
R&TTE-Richtlinie 99/5/EG EMV-Richtlinie 2004/104/EG *R&TTE-Directive 99/5/EG* *EMV- Directive 2004/104/EG*	ETSI EN 301489-1 V1.8.1: 2010	*Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;* *Part 1: Common technical requirement*
	ETSI EN 301489-7 V1.3.1: 2006	*Electromagnetic compatibility and Radio spectrum Matters (ERM) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services - Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)*
	EN 300440-2 V1.2.1: 2007	*Electromagnetic compatibility and Radio spectrum Matters (ERM) Short range devices - Radio equipment to be used in the 1 GHz to 40 GHz frequency range* *Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive*
	EN 60950-1:2006	*Safety of information technology equipmen*
	ETSI EN 301 511 V9.0.2: 2003	*Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements of article 3.2 of the R&TTE directive (1999/5/EC)*

Oberhaching, den 07.07.2014

Frank Heineck

11.2 FCC Verification

Telic

Telic Telematik & Telemetrie GmbH
Raiffeisenallee 12b
82041 Oberhaching
Telefon 089 / 49 02 686 0
Telefax 089 / 49 02 686 18

FCC Verification

Manufacturer Name:	Telic GmbH
Product Name:	SBC3
Product Model Number:	0346, 0304, 0323, 0325 and 0326 (First four digits of the Product Serial Number)

Regulations to which conformity has been verified

Type of Test:	FCC 47 CFR Part 15 Subpart B Class B
Measurement Procedures:	ANSI C63.4 (2009)
Test House:	Herberg Service Plus GmbH (ECL)
Test Report:	10-175

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:
(1) this device may not cause harmful interference
(2) this device must accept any interference received, including interference that may cause undesired operation.

This device contains a Transmitter Module FCC ID: R17GE865
with following Grant Notes:

"The antenna gain, including cable loss, must not exceed 3.0 dBi at 1900 Mhz / 1.4 dBi at 850 MHz as defined in 2.1091 and 1.1307 of the rules for satisfying RF exposure compliance. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operation in conjunction with any other antenna or transmitter."

The gain of the antenna inside this device is below 0dBi.

Manufacturer's name:
And address:

Telic GmbH
Raiffeisenallee 12b
82041 Oberhaching / München
Germany

20.05.2014

Date / Name: Frank Heineck
(Director)

12 Document history

Revision	Date	Changes
Rev 1.0	15.01.2012	Release
Rev 2.0	10.1.2013	Update HW SW details
Rev 2.1	14.6.2013	Correct data
Rev 2.2	02.04.2014	Layout Update Added SBC3 CAN with external antennas + SBC3 CAN Power
Rev 2.3	29.04.2014	Update in Section 4.2.1.
Rev 2.4	11.07.2014	Update Section 11

Table 14: Document history